Claims 6-8

The Official Action rejects claims 6-8 under 35 U.S.C. §112, second paragraph as being indefinite. The Applicant traverses the rejection. The Applicant has amended claims 6-8 for clarification purposes, such that they overcome the Examiner's rejection. The Applicant requests that claims 6-8 be allowed.

Claims 1-3 and 20

The Official Action rejects claims 1-3 and 20 under 35 U.S.C. §102(e) as being anticipated by Dupray, U.S. Patent No. 6,249,252 (hereinafter "the Dupray patent"). The Applicant traverses this art grounds of rejection.

While it is true that the Dupray patent teaches a system for outputting requested locations of commercially available handsets or mobile stations, it does not teach, disclose or make obvious the Applicant's claims. To the contrary, the Dupray patent teaches a system that combines multiple conventional wireless location computational estimators, referred to as first order models ("FOM"). Each of the FOMs taught in the Dupray patent are known and use a different technique for determining a location estimate for the target mobile stations. See Dupray; col. 37, line 36-42; col. 3, line 35-45. The Dupray patent clearly states that the invention is, "utilizing a plurality of mobile station estimation techniques to compensate for location estimator

errors generated by such techniques." The Dupray patent states that "multiple computational location models (FOMs) may be activated substantially simultaneously...." Dupray; col. 25, line 35-39. The Dupray patent further teaches assigning each one of the FOMs, used in its process, a type of reliance indicator which indicates the confidence and likelihood of the accuracy of estimation. Therefore, the Dupray patent does not attempt to teach a novel "first order method" or manner of collecting measurements of wireless signals, but instead teaches combining two or more known first order methods to obtain the estimated position of the mobile stations.

The Dupray patent does not teach or disclose the method recited in Applicant's claims 1-3 and 20. Specifically, none of the conventional FOMs disclosed in the Dupray patent teach, "receiving measured attribute information from a mobile unit location..." and "computing the probability of the mobile unit being at a specific location in the area in response to said received attribute information using **a likelihood probability function**" as recited by Applicant's claim 1. (Emphasis added). Further, non of the conventional FOMs disclosed in the Dupray patent teaches, "said computing apparatus further including software for calculating, in response to one or more attribute values being measured and reported by the mobile unit from a specific location within the service area, a predicted location of the mobile unit within the service area using **a likelihood probability function**," as taught by

the Applicant's claim 20. Having shown that the Dupray patent fails to teach, disclose or make obvious the Applicant's claim 1 and 20, the Applicant requests allowance of claim 1 and 20.

The Applicant has shown claim 1 is allowable. Claims 2-3 depend from allowable claim 1. Therefore, the Applicant requests claims 2-3 be allowed.

Claims 1-20 (Chang)

The Examiner has rejected claims 1-20 under 35 U.S.C. §102(e) as being anticipated by Chang et al.; U.S. Patent No. 6,263,208 (hereinafter "the Chang patent"). Applicant traverses this §102(e) rejection.

Applicants respectfully submit that the Chang patent does not qualify as prior art under 35 U.S.C. §102(e), as evidenced by the attached Declaration from inventors Chang, Jeske and Rege. Applicants respectfully submit that the subject matter of the Chang patent relied upon to reject claims 1 and 20 of the present application is actually Mr. Chang, Mr. Jeske and Mr. Rege's own invention.

35 U.S.C. §102(e) prior art must be prior art by that of another. In the present instance, the disclosure in the Chang patent is not by another, but rather by Chang, Jeske and Rege themselves. Accordingly, applicants respectfully submit that the Chang patent is not 35 U.S.C. §102(e) prior art

against claims 1 and 20 of the present application. Applicants direct the Examiner's attention to the attached Declaration.

In view of the attached evidence, withdrawal of the present rejection is respectfully requested with respect to claims 1 and 20.

Claim 1 is allowable. Claims 2-19 depend from allowable claim 1. The Applicant requests that claims 2-19 be allowed.

Claims 1-11 and 20 (Double Patenting Rejection)

Claims 1-11 and 20 are rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of the Chang patent. The Applicant respectfully points out that the Examiner has made an improper non-statutory double patenting rejection. Under Section 804(II)(B)(1), the M.P.E.P. provides that a proper double patenting rejection of the obviousness-type is "analogous to [a failure to meet] the obviousness requirement of 35 U.S.C. §103," with understanding that the patent principally underlying the double patenting rejection is not prior art. *In re Braithwaite*, 379 F.2d 594, 154 USPQ 29 (CCPA 1967). The M.P.E.P. further requires that the Graham factors of inquiry be summarized and any obviousness-type double patenting rejection make clear:

> (A) The differences between the inventions defined by the conflicting claims - a claim in the patent compared to a claim in the application; and

(B) The reasons why a person of ordinary skill in the art would conclude that the invention defined in the claim in issue is an obvious variation of the invention defined in a claim in the patent.

The Examiner has not performed the above-identified analysis; therefore he has not established a proper obviousness-type double patenting rejection.

Further, claims 1-11 and 20 of the present application are not obvious in view of claims 1-21 of the Chang patent. Claims 1-21 of the Chang patent claims a method of receiving signal strength measurements of a mobile unit in the service area of a cellular telephone system. The Chang patent computes the location probability distribution using Bayes theorem and generates an output indicative of the probability of the mobile units location.

In contrast, Applicant's claims 1 and 20 recite "computing the probability of the mobile unit being at a specific location in the service area in response to said received attribute information **using a likelihood probability function**," and "said computing apparatus further including software for calculating, in response to one or more attribute values being measured and reported by the mobile unit from a specific location within the service area, a predicted location of the mobile unit within the service area **using a likelihood probability function**," respectively. Therefore, for at least the reasons set forth above, the Examiner's non-statutory double patenting rejection of claims 1 and 20 is improper. The Applicant respectfully requests that claims 1 and 20 be allowed.

Claim 1 is allowable, and claims 2-11 depend directly or indirectly from claim 1. Therefore, the Applicant requests that claims 2-11 be allowed.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Terance Madden at (703) 668-8024.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

HARNESS, DICKEY & PIERCE, PLC

By _____ #35,054
Gary D. Yacura
Reg. No. 35,416

GDY/TM:jcp

P.O. Box 8910
Reston, VA 20195
(703) 668-8000

Enclosure: Declaration (unsigned)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

Please amend the specification as follows:

On page 1, please replace the first paragraph with the following paragraph:

--This application is related to U.S. Serial No. 09/139,107, now U.S. Patent No. 6,496,701 entitled "Pattern Recognition-Based Geolocation", filed in the names of T.C. Chiang et al on August 26, 1998; U.S. Serial No. 09/294,997 entitled "A Bayesian-Update Based Location Prediction Method For CDMA Systems", filed in the names of K.K. Chang et al on April 20, 1999; and U.S. Serial No. 09/321,729, now U.S. Patent No. 6,263,208, issued on July 17, 2001, [(Lucent file #CHANG 4-2-16)] entitled "Geolocation Estimation Method For CDMA Terminals Based On Pilot Strength Measurements", filed in the names of K.K. CHANG et al on May 28, 1999. These related applications are assigned to the assignee of the present invention and are meant to be incorporated herein by reference.--

On page 2, please replace the first full paragraph with the following paragraph:

--In the [first] above-noted related patent application U.S. [Serial No. 09/139,107] Patent No. 6,496,701 entitled "Pattern Recognition-Based Geolocation", RF characteristics pertaining to one or more pilot signals radiated from a base station and specific to a particular location within the service area are detected by a mobile unit and transmitted back to a base station where they are matched to a known set of RF characteristics and other information obtained from making attribute information measurements at all the grid points (sub-cells) in a cellular service area and which are then stored in a database located, for example, in a base station server.--

On page 2, please replace the second full paragraph with the following paragraph:

--In the [second] above-noted related patent application U.S. Serial No. 09/294,997 entitled "A Bayesian-Update Based Location Prediction Method For CDMA systems", the invention is directed to a method of estimating, by a Bayesian probability algorithm, the location of a mobile unit in the service area of a CDMA cellular telephone system using a model based approach which, among other things, simplifies the generation of a database containing a pilot signal visibility probabilities. This eliminates the need for repeated attribute measurements at all of the grid points in the service area.

On page 2, please replace the third full paragraph with the following paragraph:

--In the [third] above-noted related patent U.S. Patent No. 6,263,608 [application U.S. Serial No. _____], entitled "Geolocation Estimation Method For CDMA Terminals Based On Pilot Strength Measurements", the invention is directed to a method of estimating the location of a mobile unit in the service area of a CDMA cellular telephone system also using a model based approach, but which now eliminates the need for a stored database containing pilot signal visibility probabilities for all of the grid points or sub-cells in the cellular service area. The estimation procedure is based entirely on analytical results involving one or more key approximations derived, for example, from an integrated model of the wireless communications system, its RF environment, and attribute measurement.--

On page 4, please replace the third full paragraph, containing lines 15-23, with the following paragraph:

--In the invention described in the [first] referenced related patent, U.S. Patent No. 6,496,701 [application Serial No. 09/139,107] entitled "Pattern Recognition-Based Geolocation," each sub-cell $18_1, \ldots, 18_n$ of the service area 10 is identified by a set of observable characteristics which are referred to as attributes. Examples of attributes are pilot signal strengths (Ec/Io), phase-

offsets, angles of arrival, and pilot round trip delays. The invention of Patent No. 6,496,701 [Serial No. 09/139,107] includes a database which contains attribute information which differentiates one sub-cell 18 from another and is generated by making a repeated and exhaustive survey which involves taking repeated measurements at all the sub-cells 18_1 ,..., 18_n (Figure 2) of the service area 10.--

On page 5, please replace the second paragraph, containing lines 7-22, with the following paragraph:

--In the [second] above-referenced related application, Serial No. 09/294,997, entitled "A Bayesian-Update Based Location Prediction Method For CDMA systems", a database is also used to assist the process of location estimation. However, in contrast to the first referenced patent application, i.e. [Serial No. 09/139,107] U.S. Patent No. 6,496,701, it uses a model based approach to generate a database containing pilot visibility probabilities for different sub-cells 18 in the service area 10. The model-based approach requires that a limited number of pilot strength measurements be carried out along a few representative routes in the service area 10. These measurements are then used to identify the parameters of the model that characterizes the service area and its RF environment. Once these parameters are identified, simulations are then carried out to populate the database containing the pilot

visibility probabilities, which are used in the computation of the location distribution of a mobile unit requesting location service. An iterative procedure based on a Bayesian probability computation is then used to obtain improved estimates of the mobile unit's location in response to multiple sets of attribute measurements being reported by the mobile unit 20. The model-based approach eliminates the need to carry out extensive measurements required by the first named invention, U.S. Patent No. 6,496,701 [Serial No. 09/139,107].

On page 5, please replace the third paragraph, containing lines 23-29, through page 6, lines 1-2, with t he following paragraph:

--In the [third] above-referenced related patent U.S. Patent No. 6,263,208 [application Serial No. _____], entitled "Geolocation Estimation Method For CDMA Terminals Based On Pilot Strength Measurements", the model-based approach embodied in Serial No. 09/294,997, "A Bayesian-Update Based Location Prediction Method...." to characterize the RF environment is used, as is the iterative procedure for computing the Bayesian posterior distribution for the location of the mobile. However, the database containing pilot visibility probabilities is replaced by analytical formulas that can be evaluated in real time. The evaluation procedures are compact and can typically be evaluated in the digital computer apparatus 23 shown in Figure 3.--

On page 6, please replace the second paragraph, containing lines 3-18, with the following paragraph:

--Considering the present invention, the analytic formulation for the pilot visibility probabilities taught in the [third] above-referenced patent, U.S. Patent No. 6,263,208 [application Serial No._____], "Geolocation Estimation Method For CDMA terminals Based On Pilot Strength Measurements", now serve as the starting point for the derivation of two likelihood functions, hereafter referred to as the frequentist and Bayes-modified likelihood functions, respectively. Each of the likelihood functions is derived based on the assumptions and mathematical formulations described in attached Appendix A. In as much as the likelihood functions depend on the analytic evaluation of the pilot visibility probabilities, attached Appendix B provides a self-contained development of the relevant details of these formulas. Each likelihood function is a function of (x, y), an arbitrary location of the mobile unit 20 in the x and y grid shown in Figure 2. Accordingly, each likelihood function is used in a first method to obtain a maximum likelihood (ML) estimator of the location of the mobile unit 20 by finding the (x, y) coordinates which maximizes the value of the respective likelihood function. An iterative technique for sequentially updating each ML estimator with additional pilot signal strength

measurements is utilized. In a second method, each of the two likelihood functions are also incorporated into a sequential Bayesian procedure, which outputs a posterior distribution for the location of the mobile unit.--

On page 17, please replace the first paragraph with the following paragraph:

--In this Appendix, we drive the approximations $\tilde{\theta}_{ij}(x,y)$ of the pilot visibility probabilities. The notation used in this Appendix is the same as what has been introduced earlier in this specification. Consider a grid point $(x,y) \in A$. As in the above-referenced related patent U.S. Patent No. 6,263,208 [application Serial No._____], entitled, "Geolocation Estimation Method For CDMA Terminals Based On Pilot Strength Measurements", the RF power received by the mobile unit 20 from sector j of base station i is modeled by the expression

$$R_{ij}(x,y) = T_{ij}G_{ij}(x,y)L_{ij}(x,y)F_{ij}(x,y)M_{ij}(x,y) \qquad \text{(B1)}$$

where T_{ij} is the transmit power associated with the sector, $G_{ij}(x,y)$ is the antenna gain for the sector along the direction pointing towards the location $(x,y) \in A$, $L_{ij}(x,y)$ is the distance loss between the base station associated with the sector and the location $(x,y) \in A$, $F_{ij}(x,y)$ is the shadow fading factor and $M_{ij}(x,y)$ is the measurement noise factor, all in absolute, not dB, units. The

measurement noise factor is meant to include the effects of fast fading (e.g., Rayleigh/Rician) as well as inaccuracies in the measurement process. If γ denotes the fraction of T_{ij} that is used for the pilot channel, then $\gamma R_{ij}(x,y)$ is the pilot channel power received by the mobile unit 20 when it is located at $(x,y) \in A$.--

IN THE CLAIMS

6. (Amended) A method according to claim 1 wherein said procedure comprises [a] sequential Bayesian [type of] procedure characteristics.

7. (Amended) A method according to claim 6 wherein said sequential Bayesian [type of] procedure characteristics are implemented as [uses] a frequentist likelihood function.

8. (Amended) A method according to claim 6 wherein said sequential Bayesian [type of] procedure characteristics are implemented as [uses] a Bayes-modified likelihood function.